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(71) Applicants
Aktiebolaget Bofors,
S-691 80 Bofors, Sweden
(72) Inventors
Arne Franzen
Thomas Gustavsson
(74) Agents
Lloyd Wise, Tregear & Co.

(54) Method of manufacturing projectiles

(57) The present invention relates to a method of fastening driving bands to projectiles, e.g. artillery shells. Such driving bands are generally made of a softer material than the shell. They have previously been fastened to the rear part of the shell body by means of a press fit or a combination of a press and shrinkage fit.

The present invention now provides for a simpler and more reliable connection between the shell body and the driving band by friction welding the driving band to the shell body. The driving band may be of sintered iron.

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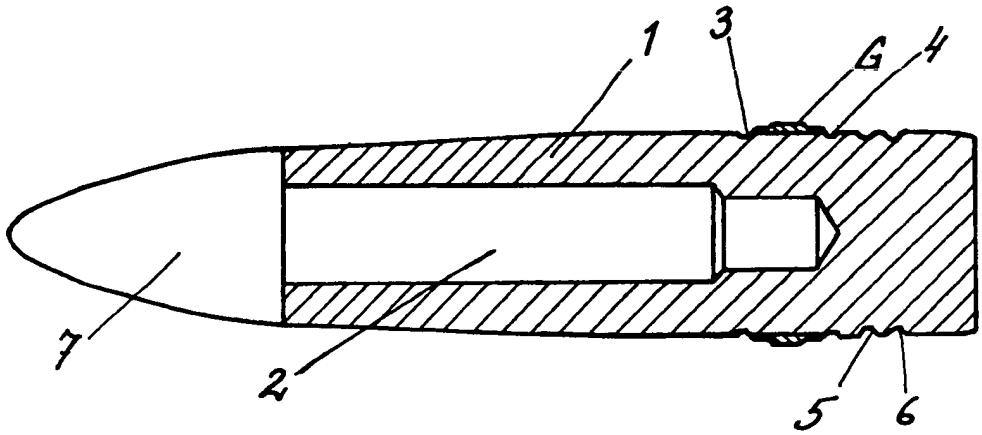

Fig.1

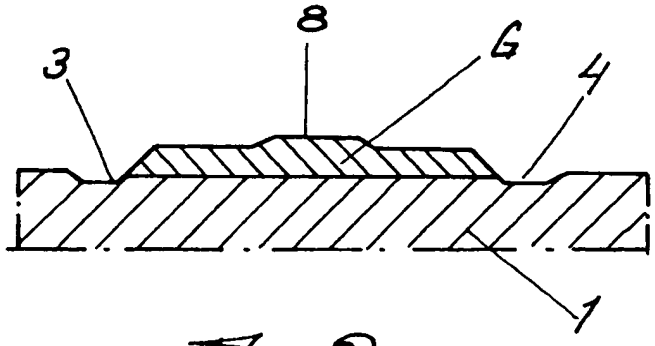

Fig.2

SPECIFICATION

Method of manufacturing pr j ctiles

The present invention relates to a method of fastening a driving band to a projectil such as an artillery shell.

Projectiles with larger calibres than those used for hand firearms and so-called heavy machine guns are generally provided with a driving band fastened to the rear part of the projectile to obturate the bore of the barrel and to cause the projectile to rotate in the barrel as it is fired therefrom. The driving band is generally made of a softer material than the rest of the projectile to reduce wear of the rifling.

Press fits or a combination of press and shrinkage fits have previously been used to fasten the driving band in place on the projectile body.

However, new requirements for increased velocities and ranges have made it necessary to increase the muzzle velocity of the projectiles to such an extent that it is not entirely certain than the press or shrinkage fits is sufficient to retain the driving band in its place even if it is fitted into a groove in the envelope surface of the projectile.

The present invention relates to a new method of fastening a driving band to the envelope surface of the projectile. According to the invention, the driving band is friction welded to the envelope surface of the projectile. Friction welding is a technique which is known in itself, but in the present connection this technique is thus used for a very special purpose.

Artillery projectiles are usually made of toughened steel, while the driving band is usually made of copper or copper alloys. With a method in accordance with this invention it is possible to use a different material better suited for friction welding to the steel envelope surface of a projectile. An example of such a material is sintered iron which is softer than the steel and will thus cause less wear of the barrel rifling.

The friction welding of the driving band to the envelope surface of the projectile takes place before the final machining of the projectile.

A method according to the invention will now be described in somewhat more detail with reference to the accompanying figures in which:–

Figure 1 shows a cross-section through a projectile or charge carrier, and Figure 2 shows a detail of the same projectile on a larger scale.

The projectile shown in Figure 1 comprises a shell body 1 of, for example toughened steel, with an internal charge cavity 2. A driving band G is friction welded to the rear part of the shell body 1. Immediately in front of and immediately behind the driving band there are circumferential grooves 3 and 4 in the envelope surface of the shell, and still farether to the rear there are circumferential grooves 5 and 6 in the projectile body for assembling the compl te round. At the front end of the pr jectile there is a nose cone 7 which can comprise a fuse of some kind or other. The driving band G made of, for example an iron alloy such as sintered iron, is first friction w lded to a projectile blank, and thereafter final machining of the shell body takes plac t form the circumferential grooves and give the driving band its final shape.

As shown in Figure 2, the driving band can be made with a central ridge 8 running around its periphery.

CLAIMS

1. A method of fastening a driving band to the envelope surface of the shell, and still farther to the the inner envelope surface of a ring-shaped driving band to the outer envelope surface of a projectile blank.

2. A method according to Claim 1 wherein final machining of both the projectile body and the driving band is carried out after the driving band has been friction welded to the envelope surface of the projectile blank.

3. A method according to Claim 1 or Claim 2 wherein the driving band is made of an iron alloy.

4. A method according to Claim 3 wherein the iron alloy is sintered iron and the projectile blank is made of toughened steel.

5. A projectile having a driving band friction welded thereto.

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